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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/566,534

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Guenter Hoenig

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26646

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12/12/2006

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EXAMINER

HUFTY, JOHN PAGE

ART UNIT

PAPER NUMBER

3747

DATE MAILED: 12/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/566,534	<b>Applicant(s)</b> HOENIG ET AL.	
	<b>Examiner</b> John P. Hufty	<b>Art Unit</b> 3747	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) 1-12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 13-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 Jan 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |  |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>30 Jan 2006</u> . | 6) <input type="checkbox"/> Other: ____  |

## **DETAILED ACTION**

### ***Specification***

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. Examiner suggests "Fuel Injector Nozzle Seal".

### ***Drawings***

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the plurality of spray discharge openings of claim 22 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the

appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 24 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected,

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to make and/or use the invention. Applicant does not set forth in the specification an enabling description of the coolant feature, its function and how it works in relation to the general cooling of the engine to enable one of ordinary skill in the art to practice the seal that also possesses a cooling feature.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 23 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim is directed to an "amorphous structure". The term amorphous is vague and indefinite. Applicant is asked to define the term with precision and clarity.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 13, 14, 15, 16 and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Reiter et al. U. S. Patent 6,481,421 hereinafter referred to as reference A. Reference A discloses the invention as claimed, a fuel injector having a sleeve seal across the radial length of the injector nozzle, the seal corrugated with semi-circular protrusions (column 2 line 40-45, fig 1 feature 32). It is inherent in this structure that it will channel a flow of coolant when the sleeve seal is exposed to coolant flow of the water jacket of a cylinder head.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over reference A in view of Reiter et al. U.S. Patent 7,047,949 hereinafter referred to as reference B. To the extent that reference A does not expressly teach the use of an expansion bellows shape seal, reference B teaches an expansion bellows seal for use in a fuel system. A person of ordinary skill in the art of fuel systems possesses an undergraduate mechanical engineering degree or the equivalent from on the job experience, additionally this person is knowledgeable in the variety of sealing structures available and thermal issues of fuel systems, Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to combine reference A with B to provide a variant sealing structure of reference A.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over reference A in view of Schroeer U.S. patent 6,578,554 hereinafter referred to as reference C. To the extent that reference A does not expressly teach the use of a layered seal, reference C teaches a layered seal for securing a fuel injector to a cylinder head to suppress vibration. Therefore it would have been obvious to one of ordinary skill in the art at

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the time of invention as described above to combine reference A with C to provide suppress vibration.

Claims 19-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over reference A and C as applied to claim 18 above, and further in view of Stumpp et al. U. S. Patent 4,589,596 hereinafter referred to as reference D. Reference D teaches a nozzle cover plate on a discharge side with at least one opening for fuel jets into the combustion chamber to provide thermal protection to the nozzle from the heat of combustion (abstract). Therefore it would have been obvious to one of ordinary skill in the art as described above at the time of invention to combine reference A and C with D to provide the nozzle of an injector with protection from the thermal effects of combustion.



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**Conclusion**

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. .

Berton et al. U.S. Patent 5,129,658. Berton discloses a tubular seal with a non-uniform cross section for a fuel injector having a L shaped section which protects the nozzle.

Kato et al. U.S. Patent 6,295,969. Kato discloses smoothness of a fuel injector sleeve seal (column 9, line 50-55)

Patel U.S. Patent 5,381,600. Patel teaches enhanced heat transfer from a from an extruded tube by a corrugated cross-section

Any inquiry concerning this communication or earlier communications from the examiner should be directed to J. Page Hufty whose telephone number is 571-272-9966. The examiner can normally be reached on 9:00 am - 5:00pm, Mon- Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen K. Cronin can be reached on 571-272-4536. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JPH



STEPHEN K. CRONIN  
SUPERVISORY PATENT EXAMINER